NORTEL NETWORKS™

S12000 OUTDOOR BTS GSM 850 / PCS 1900: FCC Part 22 / FCC Part 24 Certification Filing for Nortel AB6OUTS12000 - exhibits document

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CONTENTS

1. INTRODUCTION

1.1. OBJECT

This report presents the FCC regulatory assessment realized in order to introduce the **S12000 OUTDOOR BTS** . Dual Band PCS1900/ GSM850 can coexist in the S12000 BTS.

The BTS S12000 is a new BTS including 12 Transmitters slots equipped with radio modules already used in S8000 BTS.

BTS evolution towards GPRS and EDGE : it is compatible with 8-PSK modulated signals and therefore ready to support EDGE functionalities in the future and with GMSK-modulated signals.

1.2. SCOPE OF THIS DOCUMENT

This document applies to the OUTDOOR S12000 BTS GSM 850 / PCS1900.

It is the Exhibit part of the FCC Part 24 for PCS 1900 and of FCC Part 22 for PCS 850 Certification filling for Nortel AB6OUTS12000.

This document presents only measurements done in GMSK modulation.

Certification Filing for BTS S12000 INDOOR (AB6INDS12000) has been already introduce and Part22/Part24 RF Tests have reported in the document PE/BTS/DJD/4233 [R1].

Reason for basing the BTS S12000 Outdoor certification on BTS S12000 Indoor results

Both the BTS S12000 Indoor and outdoor system use the same RF modules (DRX, PA, Coupling). In the S12000 Outdoor system these modules have the same emission configurations with the same RF transmitter path as in the S12000 Indoor system.

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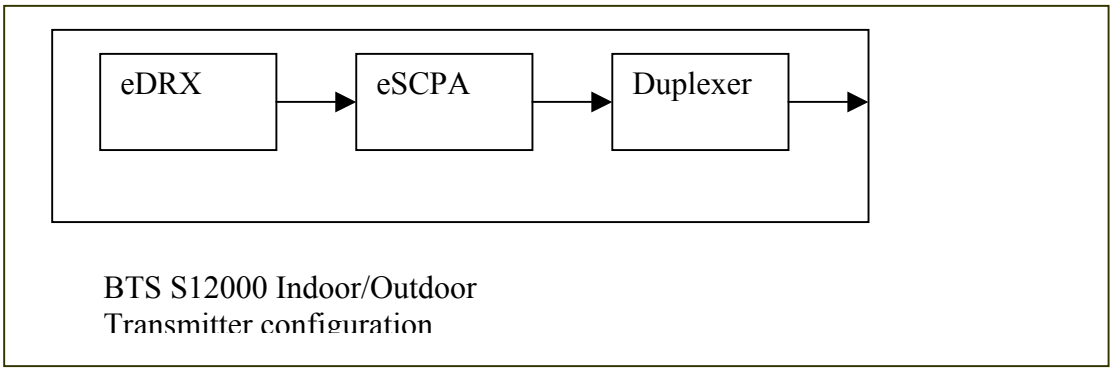


BTS S12000 Indoor/Outdoor
Transmitter configuration

The main difference between the Indoor and Outdoor configurations is the mechanical design of the BTS. The Outdoor S12000 BTS is designed to support a wider range of operating environmental conditions (temperatures ranging from -30°C to 50°C).

The differences between the thermal management systems in the Indoor and Outdoor systems are:

- The Indoor BTS is cooled by a system of fans
- The Outdoor BTS has a Direct Ambient Cooling System (DACS) which regulates the internal temperature of the BTS

The power systems in the Indoor and Outdoor systems are also different.

- The Indoor BTS is supplied by 48 V DC power which directly powers the system.
- The Outdoor BTS is supplied by AC power (230V). The energy system consists of rectifiers with DC converters to supply the system with 48 VDC power.

Due to the similarities in the systems, particularly in the RF paths, RF performances for the following tests:

- RF Power Output
- Modulation characteristics
- Occupied Bandwidth
- Spurious Emissions at Antenna Terminal

Are equivalent in the Indoor and Outdoor BTS S12000 at ambient temperature.

For these tests, RF performances in Outdoor BTS S12000 are based on RF Test performed in Indoor BTS S12000, therefore these tests are not done in Outdoor S12000.

However, due to the differences in the thermal and power management systems between Indoor and Outdoor S12000 BTS, the Frequency Stability Test is performed in extreme temperature and voltage conditions to evaluate its performance.

2. RELATED DOCUMENTS

2.1. APPLICABLE DOCUMENTS

[A1] CFR 47 - Part 2 FREQUENCY ALLOCATIONS AND RADIO TREATY MATTERS; GENERAL RULES AND REGULATIONS

[A2] CFR 47 - Part 24 PERSONAL COMMUNICATIONS SERVICES

[A3] CFR 47 - Part 22 PUBLIC MOBILE SERVICES

2.2. REFERENCE DOCUMENTS

[R1] PE/BTS/DJD/4233 V01.01/EN

S12000 Indoor BTS GSM 850 / PCS 1900:
FCC Part 22 / FCC Part 24 Certification Filing for Nortel AB6INDS12000
exhibits document

3. EXHIBIT 1: TEST REPORT

3.1. INTRODUCTION

The following information is submitted to introduce a Certification of a Broadband PCS Base Station for Northern Telecom, Inc:

- According to FCC Part 24, Subpart E and Part 2,
- According to FCC Part 22, Subpart H and Part 2,

Subpart J of the FCC Rules and Regulations. The measurement procedures were in accordance with the requirements of Part 2.999.

3.2. MEASUREMENT RESULTS

Table 1 is a summary of the measurement results performed in this report with GMSK modulation.

Table 1a: PCS 1900 Measurement Results Summary

FCC Measurement Specification	IC Limit Specification	Description	Result
2.1046 , 24.232	6.2	RF Power Output	Complies Reference to Indoor S12000 BTS [R1]
2.1047		Modulation characteristics	
2.1049		Occupied Bandwidth	
2.1051, 2.1057, 24.238	6.3 , 6.4	Spurious Emissions at Antenna Terminals	
2.1055 , 24.235	7.0	Frequency Stability	Tested for Outdoor S12000 BTS Complies

Table 1b: GSM 850 Measurement Results Summary

FCC Measurement Specification	IC Limit Specification RSS 128 Section	Description	Result
2.1046	7.1	RF Power Output	Complies Reference to Indoor S12000 BTS [R1]
2.1047	7.2	Modulation characteristics	
2.1049		Occupied Bandwidth	
2.1051	7.4 , 7.5	Spurious Emissions at Antenna Terminals	
2.1055	8.1 , 8.2	Frequency Stability	Tested for Outdoor S12000 BTS Complies

3.3. TEST NAME: 2.1046 RF OUTPUT POWER

3.3.1 FCC REQUIREMENTS

FCC Limit (Part 22.913) Effective radiated power limits

The effective radiated power (ERP) of base transmitters and cellular repeaters must not exceed 500 Watts.

FCC Limit (Part 24.232) Power and antenna hight limits

Base stations are limited to 1640 watts peak equivalent isotropically radiated power (e.i.r.p.) with an antenna height up to 300 meters HAAT. Base station antenna heights may exceed 300 meters with a corresponding reduction in power. In no case may the peak output power of a base station transmitter exceed 100 watts.

3.3.2 TEST RESULTS GSM 850

Table 2: measured RF Output Power in GSM 850 band

Radio Channel	Frequency (MHz)	Measured RF Output Power (dBm)	Maximum Rated Power (dBm)	Limit (dBm)
128	869.2	43.45	44,8 (30 W)	50
138	871.2	43.5		
148	873.2	43.6		
158	875.2	43.62		
168	877.2	43.65		
178	879.2	43.64		
190	881.6	43.6		
198	883.2	43.58		
208	885.2	43.55		
218	887.2	43.5		
228	889.2	43.5		
238	891.2	43.39		
251	893.8	43.16		

3.3.3 TEST RESULTS PCS 1900

Table 3: measured RF Output Power in PCS 1900 band

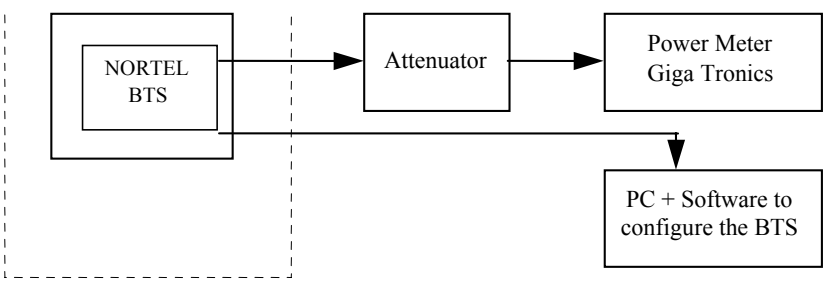
Band	Radio Channel	Frequency (MHz)	Measured RF Output Power (dBm)	Maximum Rated Power (dBm)	Limit (dBm)
A	512	1930,2	42.9	44.8	50
A	548	1937,4	43.0		
A	585	1944,8	43.2		
D	587	1945,2	43.2		
D	598	1947,4	43.2		
D	610	1949,8	43.2		
B	612	1950,2	43.2		
B	648	1957,4	43.4		
B	685	1964,8	43.4		
E	687	1965,2	43.3		
E	698	1967,4	43.3		
E	710	1969,8	43.4		
F	712	1970,2	43.4		
F	723	1972,4	43.4		
F	735	1974,8	43.5		
C	737	1975,2	43.5		
C	773	1982,4	43.5		
C	810	1989,8	43.3		

3.3.4 TEST PROCEDURE

The equipment was configured as shown in Figure 1.

Figure 1: Test configuration to measure RF Output Power

The BTS was configured to transmit at maximum power (static level 0).



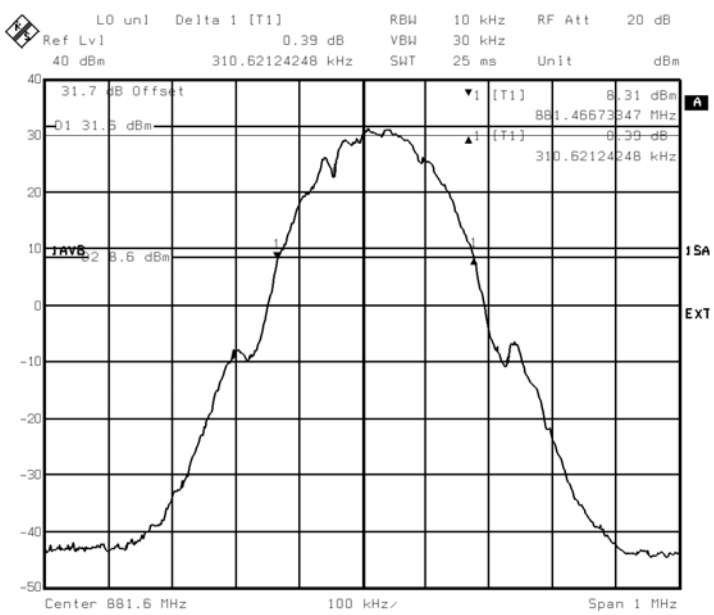
3.4. TEST NAME: 2.1049 OCCUPIED BANDWIDTH

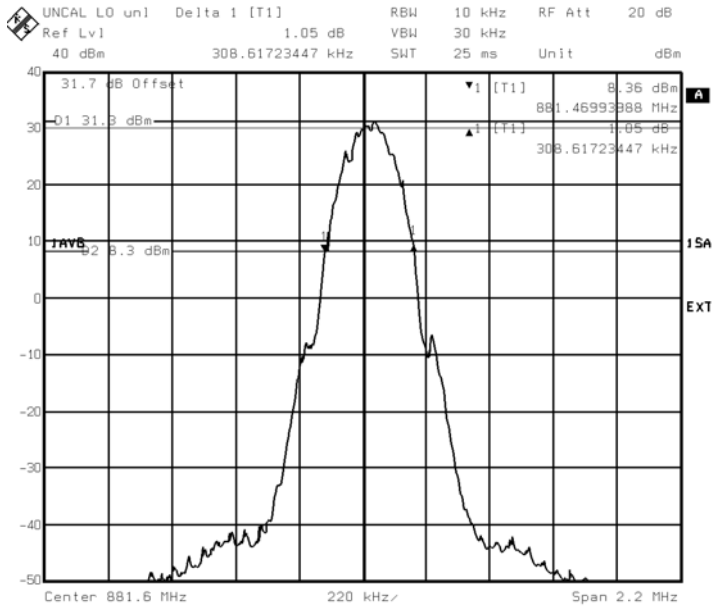
3.4.1 FCC REQUIREMENTS

The occupied bandwidth is defined as the width of the signal between two points, one below the carrier center frequency and one above the carrier center frequency, outside of which all emissions are attenuated of at least 23 dB.

3.4.2 TEST RESULTS GSM 850

Figure 2: sample plot for occupied bandwidth, @ M (GSM 850 band)



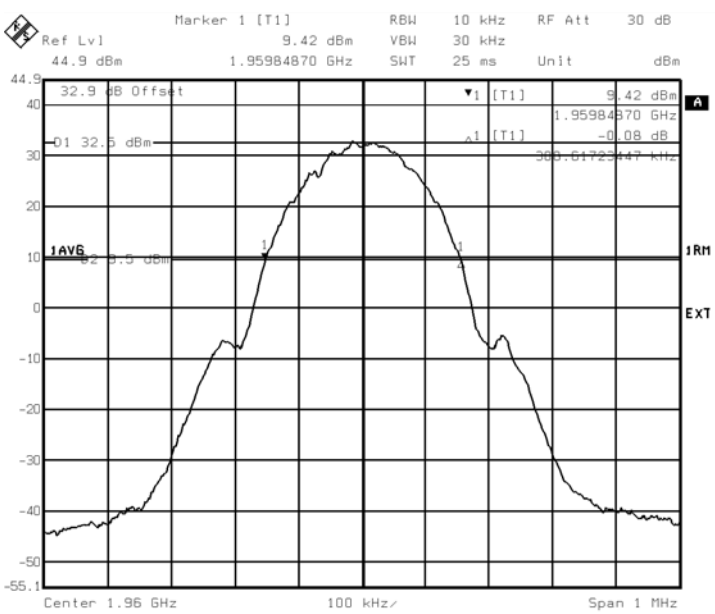


Span=1MHz Span=2.2 MHz

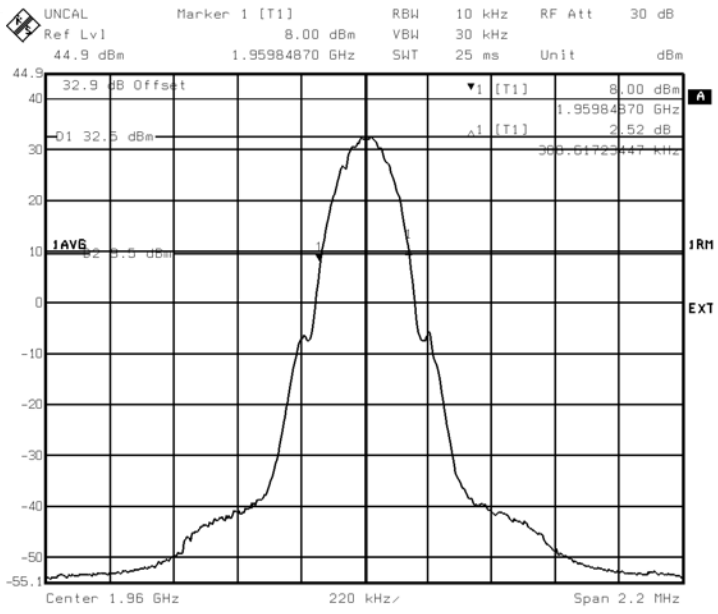
The maximum occupied bandwidth was found to be 310.6 kHz (measured on channel 190, F=881.6 MHz).

3.4.3 TEST RESULTS PCS 1900

Figure 3: sample plot for occupied bandwidth @ M (PCS 1900 band)



Span=1MHz



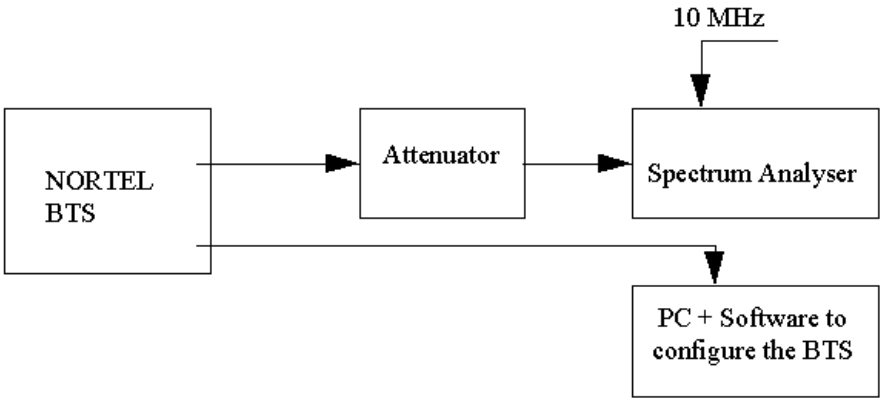
Span=2.2 MHz

The maximum occupied bandwidth was found to be 308.6 kHz (measured on channel 661, F=1960 MHz).

3.4.4 TEST PROCEDURE

The equipment was configured as shown in Figure 4.

Figure 4: Test configuration for Occupied bandwidth



The BTS was configured to transmit at maximum power (Static Level 0).
Measurements were performed at middle frequency of the transmit band.

The occupied bandwidth was measured by determining the bandwidth out of which all emissions are attenuated of at least 23 dB.

The spectrum analyzer had the following settings:

Resolution bandwidth:	10 kHz
Video bandwidth:	30 kHz
Span:	1 MHz and 2.2 MHz
Sweep time:	25 ms
Reference Level Offset:	Corrected to take into account cables and attenuator losses

3.5. TEST NAME: 2.1051 SPURIOUS EMISSIONS AT ANTENNA TERMINALS

3.5.1 FCC REQUIREMENTS

(a) At any frequency outside a licensee's frequency block, the power of any emission shall be attenuated below the transmitter power (P) by at least 43 + 10 log (P) dB.

(b) Compliance with these provisions is based on the use of measurement instrumentation employing a resolution bandwidth of 1 MHz or greater. However, in the 1 MHz bands immediately outside and adjacent to the frequency block a resolution bandwidth of at least one percent of the emission bandwidth of the fundamental emission of the transmitter may be employed. The emission bandwidth is defined as the width of the signal between two points, one below the carrier center frequency and one above the carrier center frequency, outside of which all emissions are attenuated at least 23 dB below the transmitter power.

(c) When measuring the emission limits, the nominal carrier frequency shall be adjusted as close to the licensee's frequency block edges, both upper and lower, as the design permits.

(d) The measurements of emission power can be expressed in peak or average values, provided they are expressed in the same parameters as the transmitter power.

3.5.2 TEST RESULTS GSM 850

The reference level for spurious emissions at the antenna terminals is taken from the measured output power (43.9 dBm = 24.5 Watts).
Therefore the spurious emissions must be attenuated by at least 43 + 10*Log(24.5) = 56.9 dB.
The measured output power was 43.9 dBm, therefore the limit is 43.9 - 56.9=-13 dBm.

Spurious measurement is performed with the worst configuration with Duplexer coupling and 30W Power amplifier . The Nominal power at antenna connector : P_D max =44dBm.

The test compliance with duplexer involves the compliance with H2D (two input coupler with 3dB loss coupling associated with duplexer) .

Tables 4 and 5 show the results for Spurious Emissions at Antenna Terminals in duplexer configuration.

Table 4: Test results for Spurious Emissions at Antenna Terminals

IN BAND

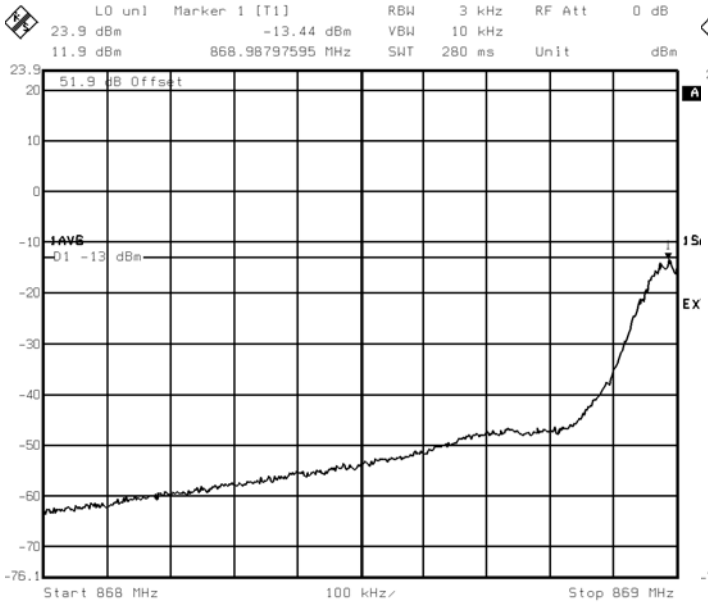
Channel	emission Level (dBm)	Spurious Emissions (dBm)	Margin (dB)	Limit (dBm)
128	Pmax-2	-15.4	2.4	-13
128	Pmax	-13.4	0.4	
190	Pmax-2	-15.1	2.1	
190	Pmax	-13.3	0.3	
190	Pmax-2	-14.6	1.6	-13
190	Pmax	-12.9	-0.1	
251	Pmax-2	-14.5	1.5	
251	Pmax	-12.2	-0.8	

Out of band

Frequency (MHz)	Spurious Emissions (dBm)	Margin (dB)	Limit (dBm)
0.1-50	-37.7	24.7	-13
50–500	-36.9	23.9	
500-880.4	-28.8	15.8	
882..8–1000	-28.2	15.2	
1000–2000	-29	16	
2000–40000	-28	15	
4000–120000	-25.5	12.5	
12000–20000	-25.7	12.7	

Figure 5: -1 MHz adjacent band (Channel 128)

Pmax



Pmax-2dB

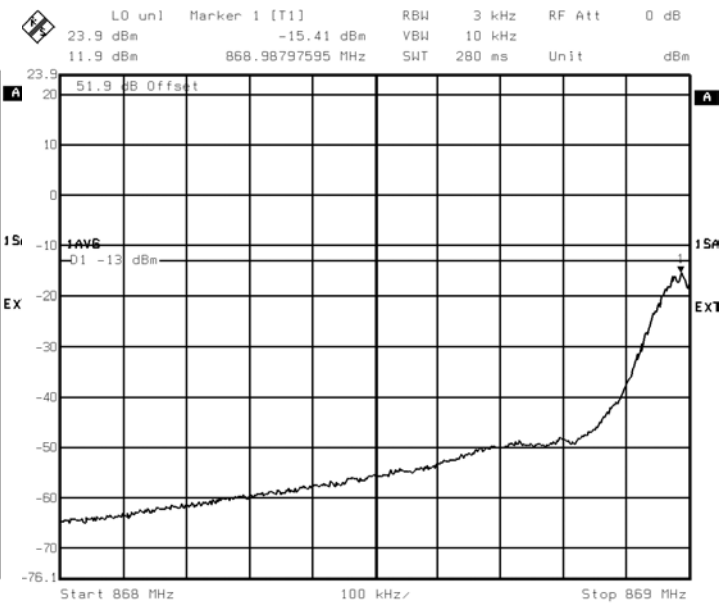
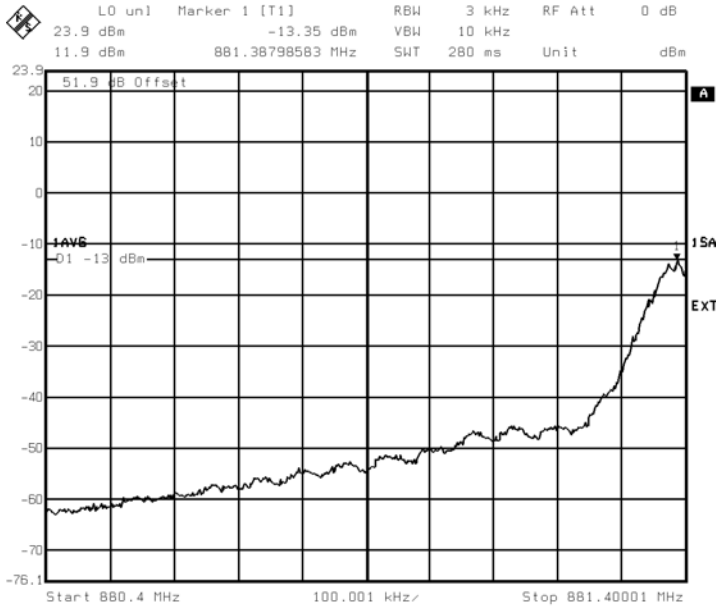


Figure 6: -1 MHz adjacent band (Channel 190)

Pmax



Pmax-2dB

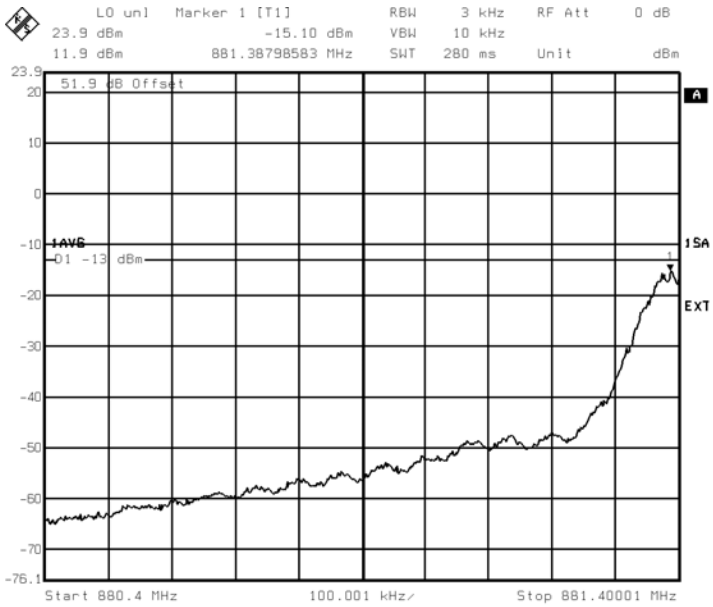
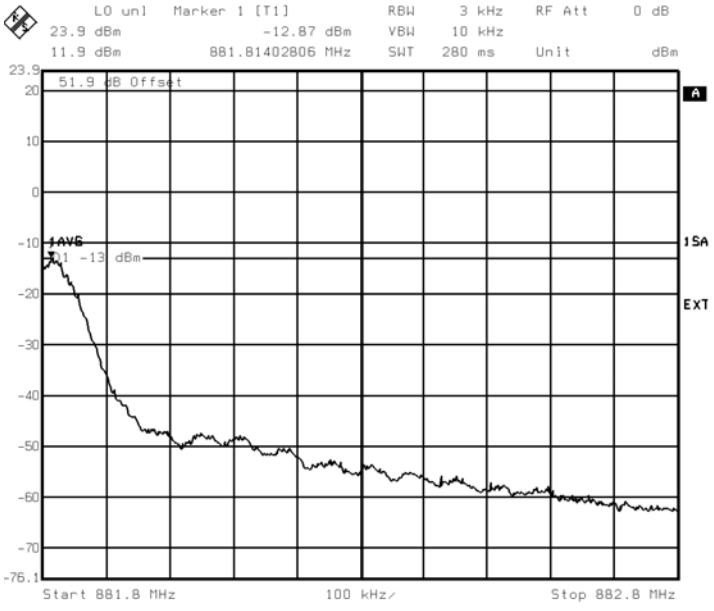


Figure 7: +1 MHz adjacent band (Channel 190)

Pmax



Pmax-2dB

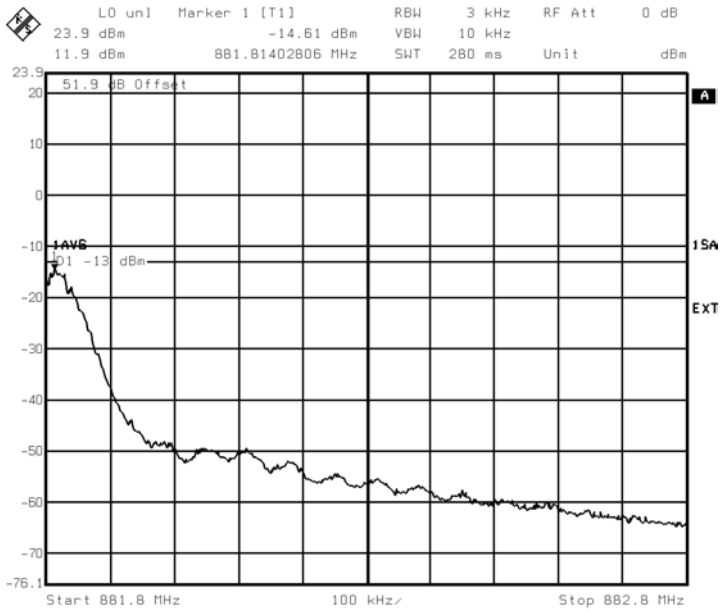
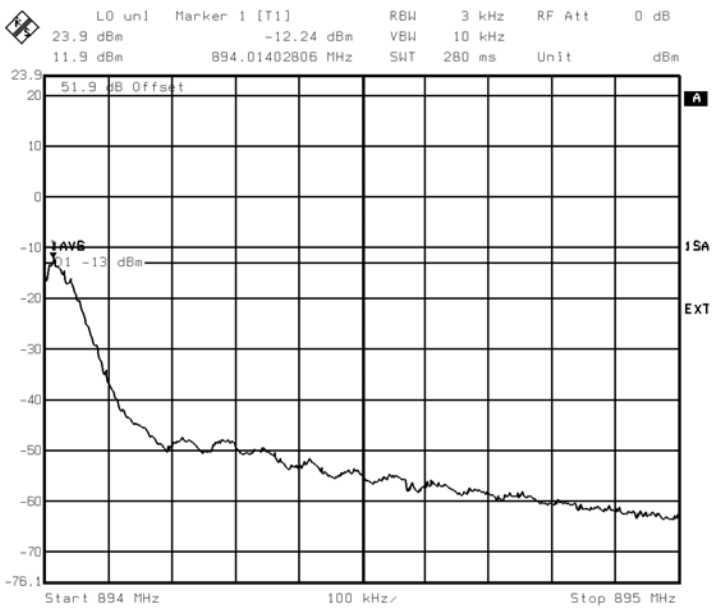


Figure 8: +1 MHz adjacent band (Channel 251)

Pmax



Pmax-2dB

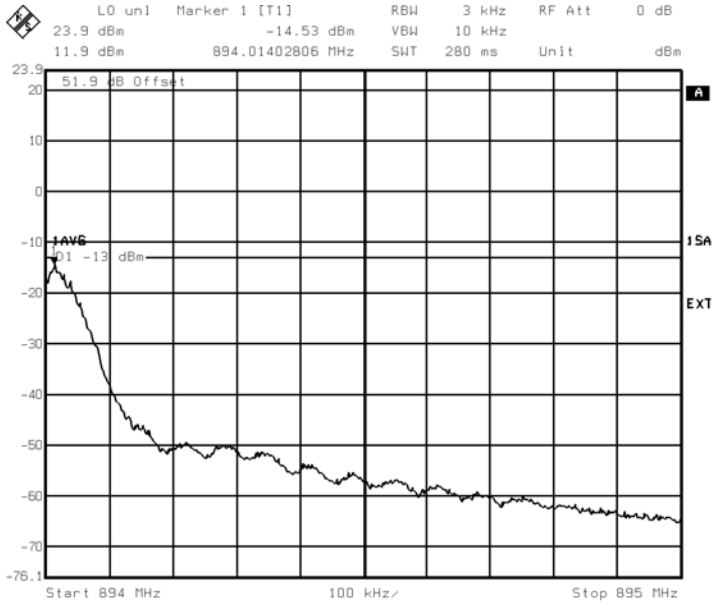
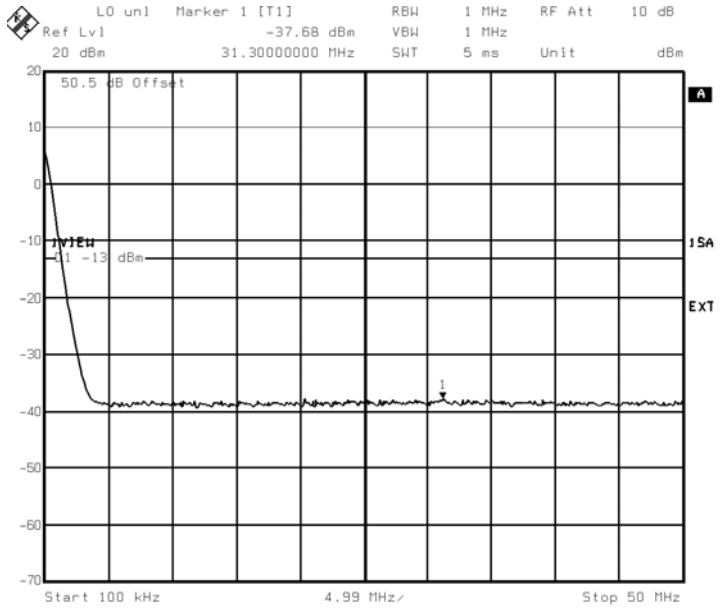


Figure 9: Out of block emissions (channel 190, Pmax)

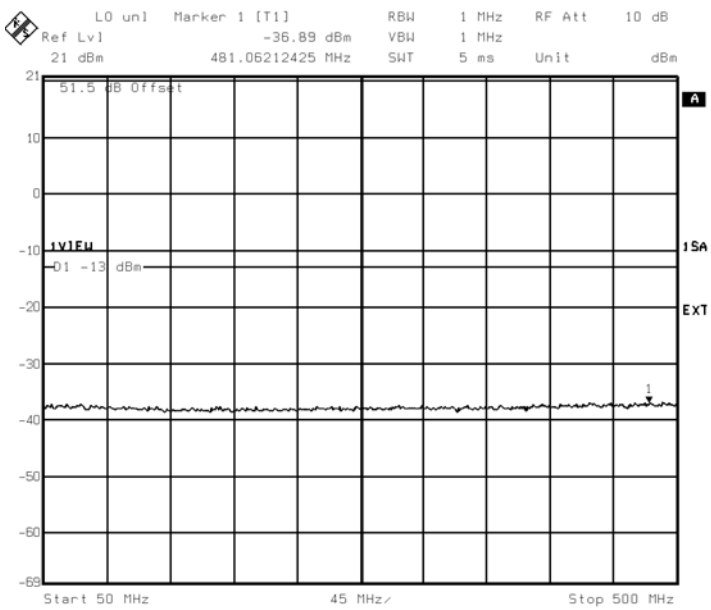
100 kHz-50 Mhz



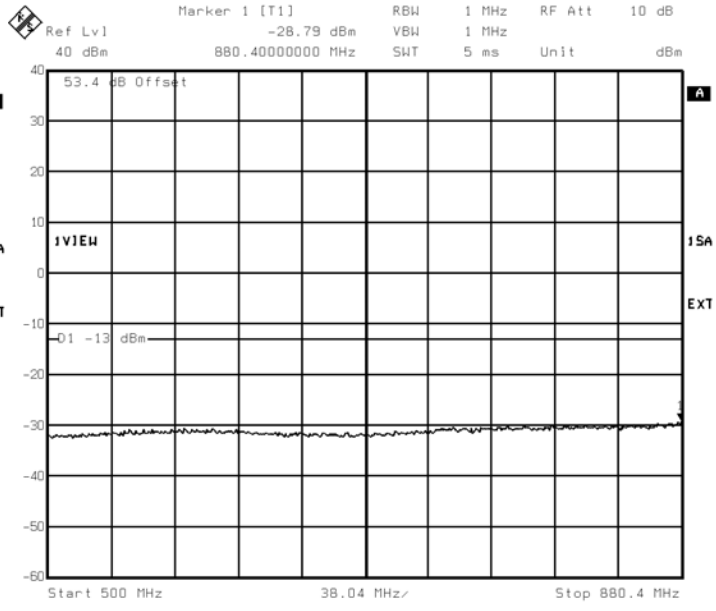
RBW = 1 MHz

Note: spectrum line s at 100 kHz are internal DC spectrum line of Analyser

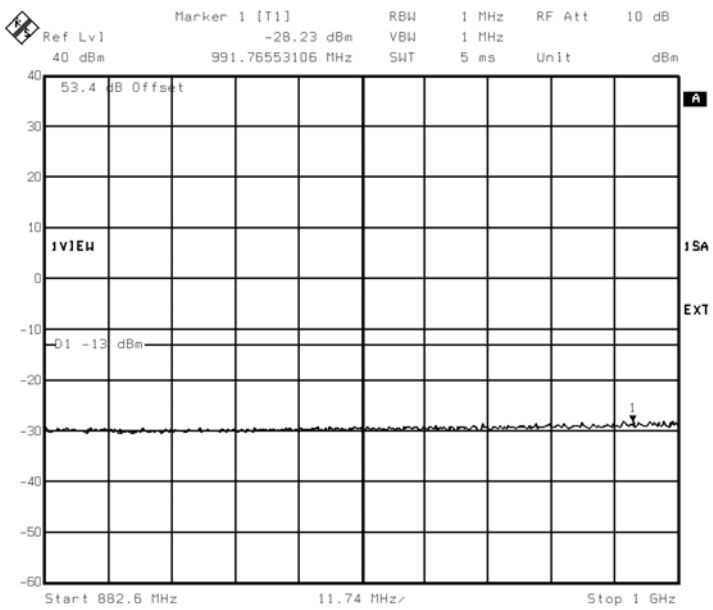
50 Mhz-500 MHz



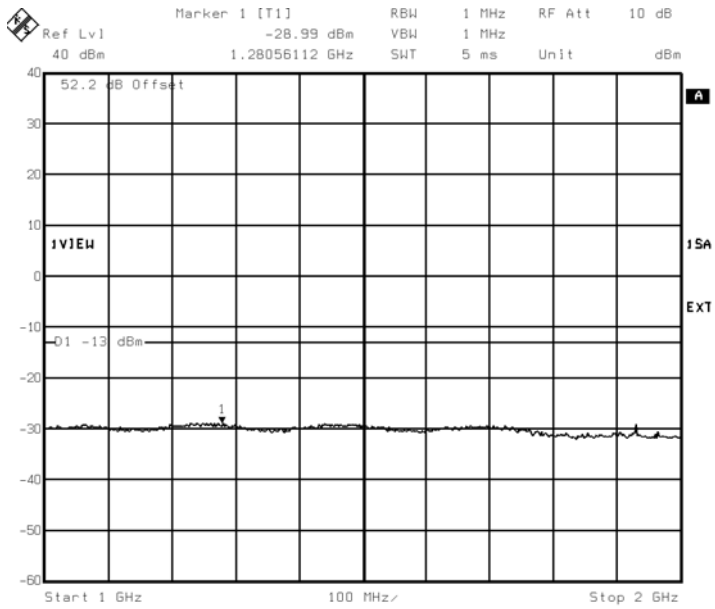
500 MHz-880.4 MHz



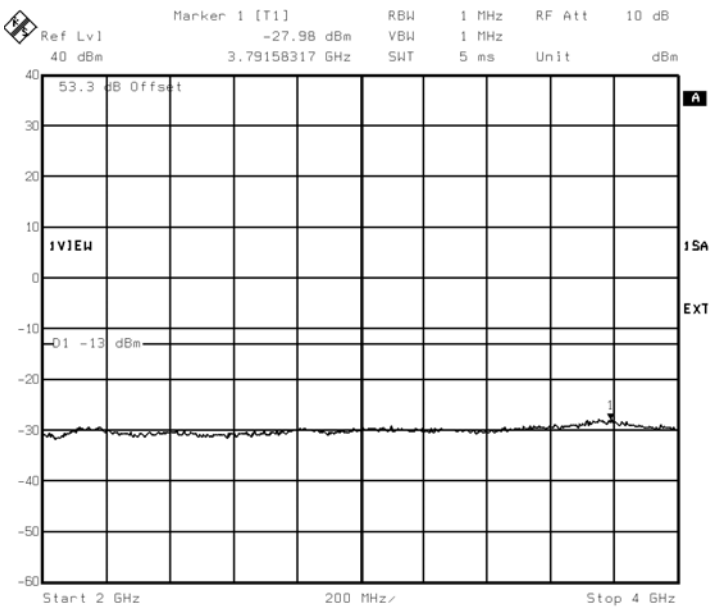
882.8 MHz-1000 MHz



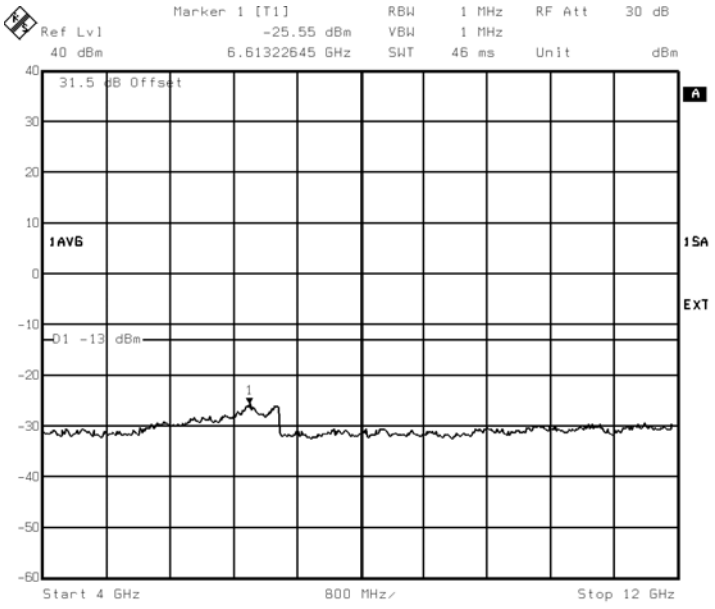
1000 MHz-2000 MHz



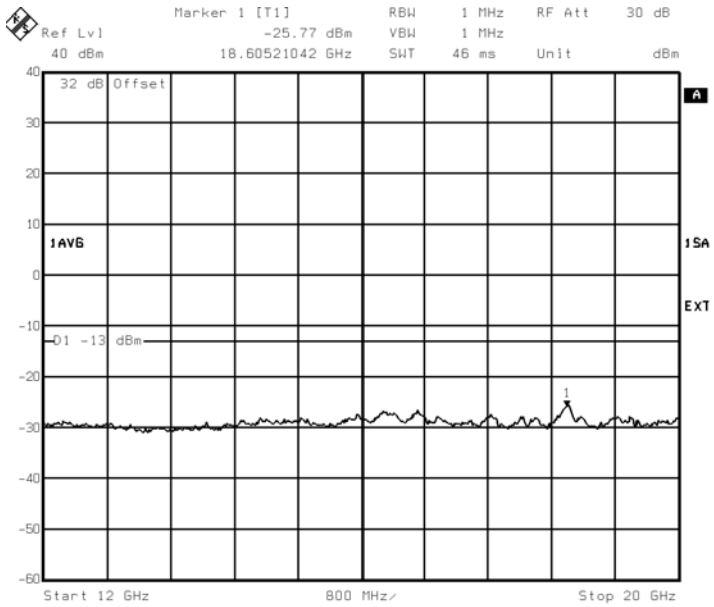
2 GHz-4 GHz



4 GHz-12 GHz



12 GHz-20 GHz



Notes:

Figure 5 to 8 show sample plots for the case when the transmitter was respectively tuned to Channel 128 and 190 and 251 (bottom and middle and top channels in Tx band) with Pmax and Pmax –2dB.

Figure 9 shows sample plots for frequency spans from 0 to 20 GHz with emission on channel 190 (middle channel) at Pmax .

Conclusion : .

The worst case is the Duplexer configuration and it has been done at P_D max - 2dB = 42 dBm

In order to comply with the emission limits in the 1 MHz bands immediately outside and adjacent to the frequency block, the absolute transmit power level of the block edge channels is set to 42 dBm in GMSK modulation at antenna connector.

3.5.3 TEST RESULTS PCS 1900

Spurious measurement is performed with the worst configuration with Duplexer coupling and 30W Power amplifier . The Nominal power at antenna connector : P_D max =44dBm. The test compliance with duplexer involves the compliance with H2D (two input coupler with 3dB loss coupling associated with duplexer) and the compliance with H4D configuration (four input coupler with 7dB loss coupling associated with duplexer).

Table 5: Test results for Spurious Emissions at Antenna Terminals - Duplexer configuration - In band

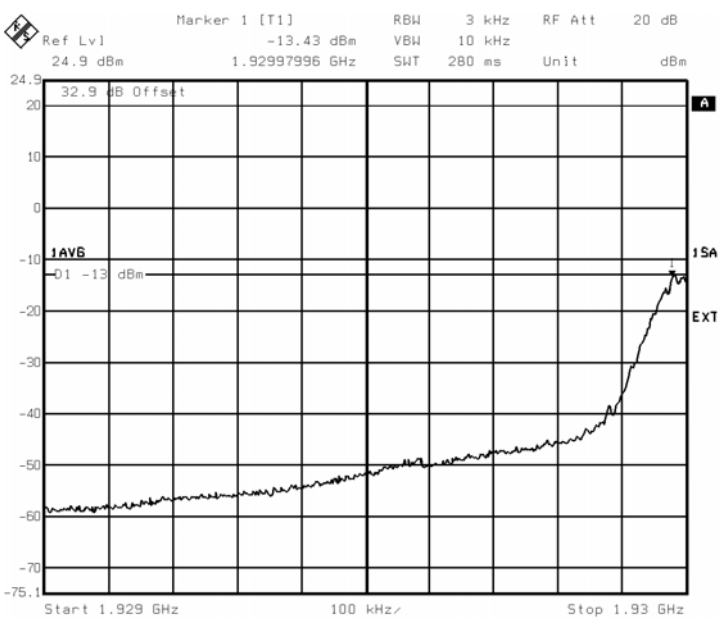
Band	Channel	Emission Level(dBm)	Spurious (dBm)	Margin (dB)	Limit (dBm)
A	512	Pmax	-13.4	0.4	-13
		Pmax-2	-15	2	
A	585	Pmax	-13	0	
		Pmax-2	-13.7	0.7	
D	587	Pmax	-12.8	-0.2	-13
		Pmax-2	-15	2	
D	610	Pmax	-11.3	-1.7	
		Pmax-2	-12.6	-0.4	
		Pmax-4	-15	2	
B	612	Pmax	-12.5	-0.5	-13
		Pmax-2	-14.5	1.5	
B	685	Pmax	-11.3	-1.7	
		Pmax-2	-12.6	-0.4	
		Pmax-4	-15	2	
E	687	Pmax	-12.4	-0.6	-13
		Pmax-2	-14.4	1.4	
		Pmax-4	-15.3	2.3	
E	710	Pmax	-10.8	-2.2	
		Pmax-2	-12.8	-0.2	
		Pmax-4	-14.5	1.5	
F	712	Pmax	-12.4	-0.6	-13
		Pmax-4	-16.3	3.3	
F	735	Pmax	-11.5	-1.5	
		Pmax-4	-14.6	1.6	
C	737	Pmax	-12.2	-0.8	-13
		Pmax-4	-16	3	
C	810	Pmax	-11.5	-1.5	
		Pmax-4	-15.5	2.5	

Out of band

Frequency (MHz)	Spurious Emissions Level (dBm)	Margin (dB)	Limit (dBm)
0.1-50	-34.2	21.2	-13
50-500	-33	20	
500-1970.2	-33.7	20.7	
1970.2-1974	-40	27	
1974-1975	-55	42	
1991-1994.8	-34	21	
1994.8-4000	-35	22	
4000-8000	-35	22	
8-12 GHz	-35.2	22.2	
12-20 GHz	-34	21	

Figure 10 a : -1 MHz adjacent band (Channel 512)

Pmax **Pmax-2dB**



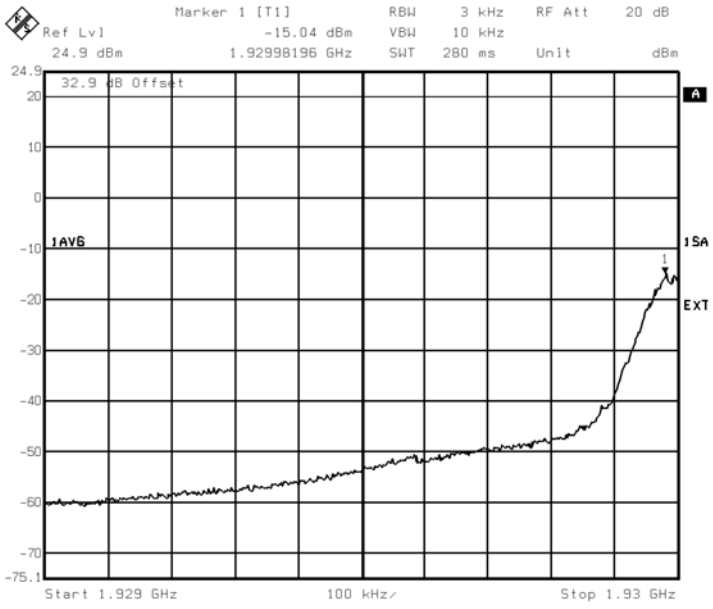
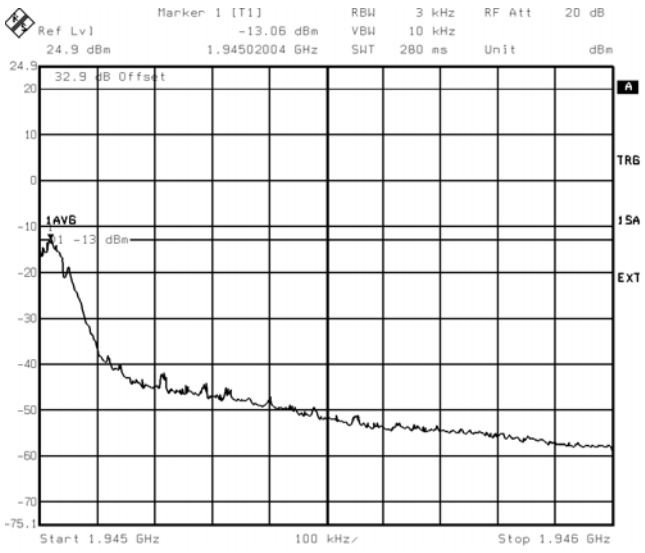


Figure 10 b : +1 MHz adjacent band (Channel 585)

Pmax

Pmax-2dB



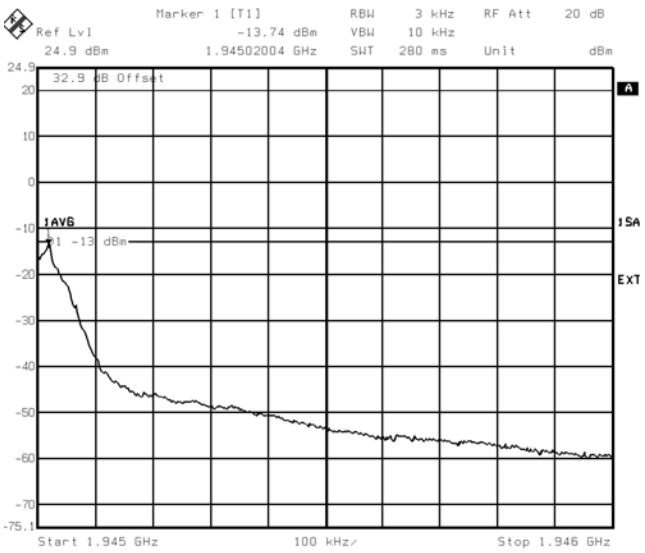


Figure 11 a : -1 MHz adjacent band (Channel 687)

Pmax **Pmax-2dB**

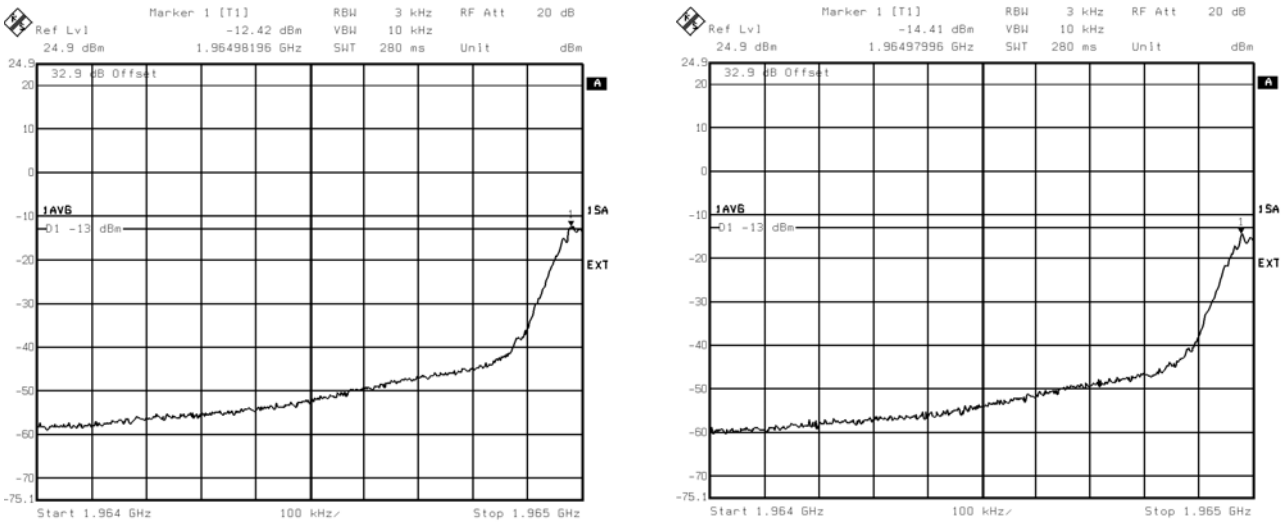


Figure 11 b : +1 MHz adjacent band (Channel 710)

Pmax **Pmax-4dB**

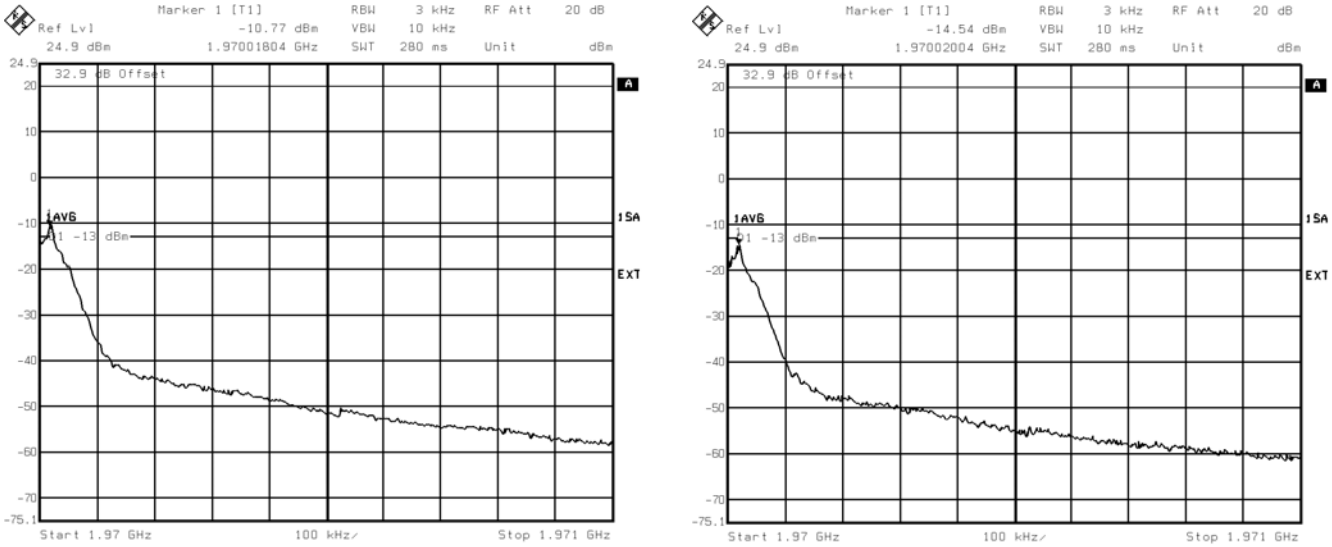
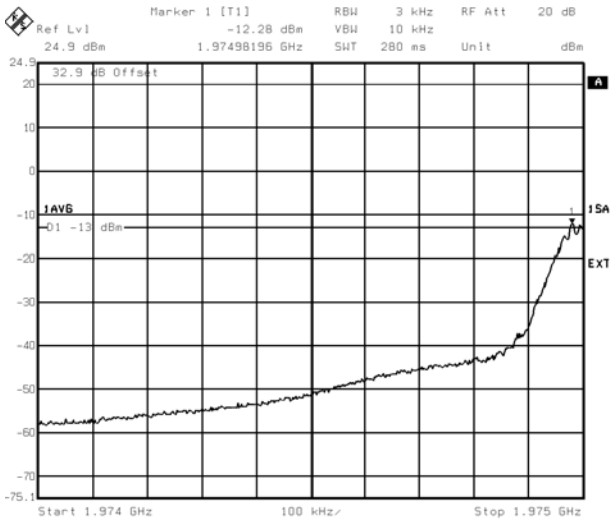


Figure 12: -1 MHz adjacent band (Channel 737)

Pmax



Pmax-4dB

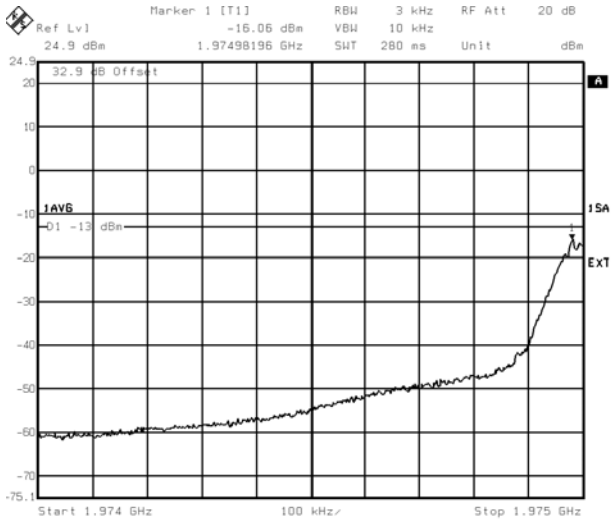
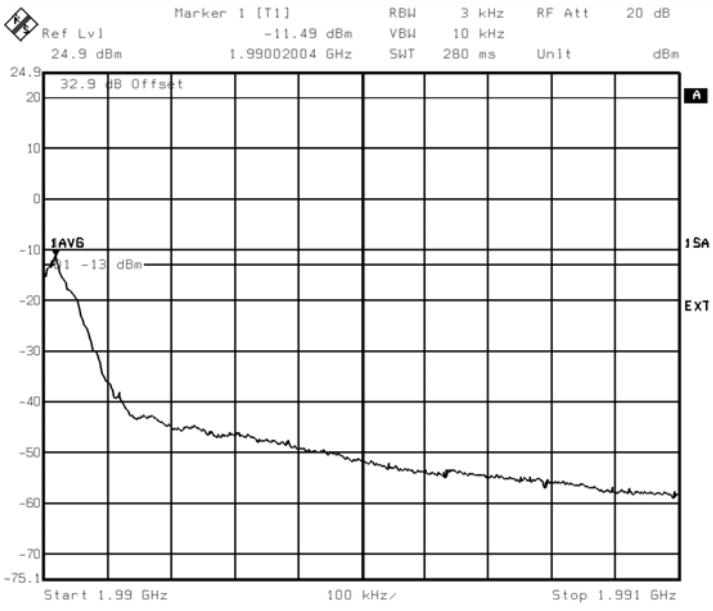


Figure 13: +1 MHz adjacent band (Channel 810)

Pmax



Pmax-4dB

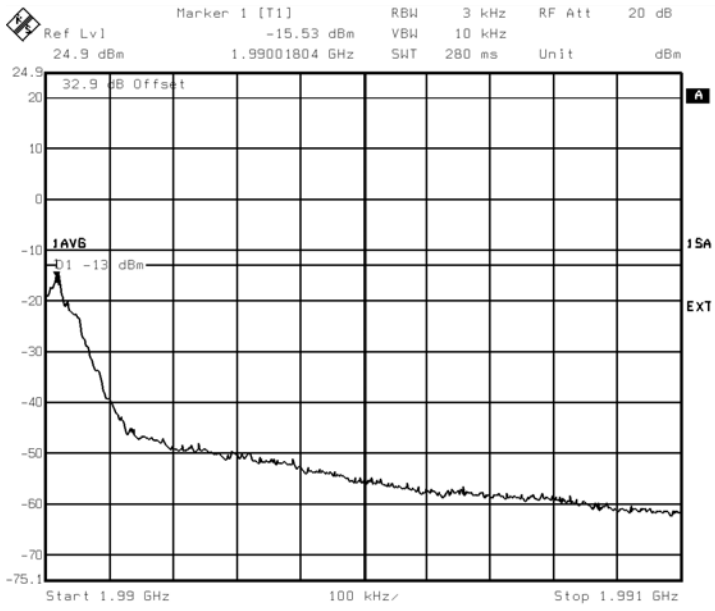
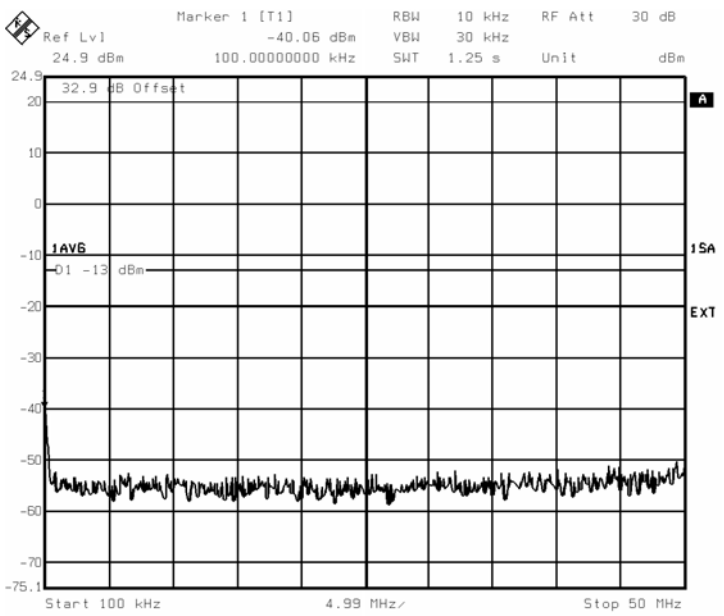
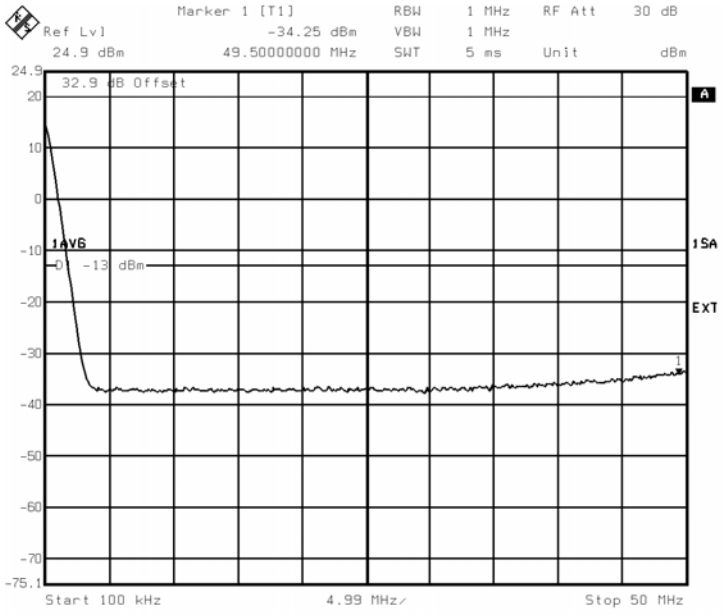


Figure 14: Out of block emissions (Channel 810, Pmax)

100kHz–50 MHz



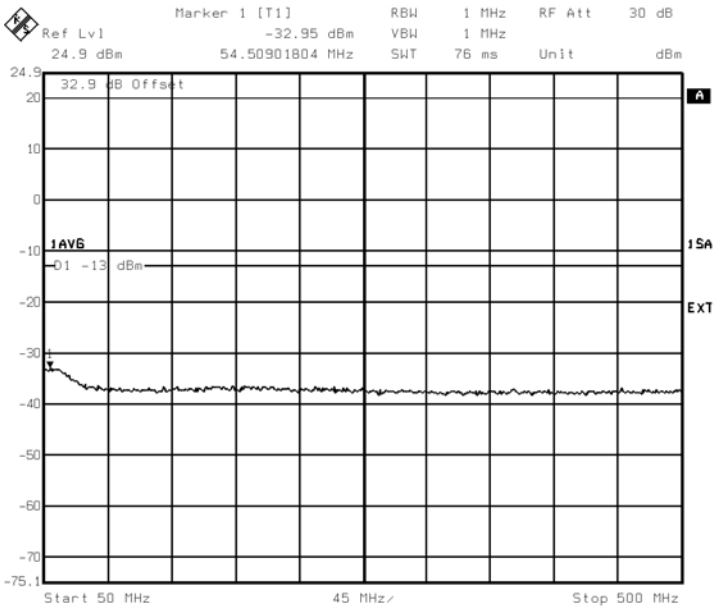


RBW = 10 kHz

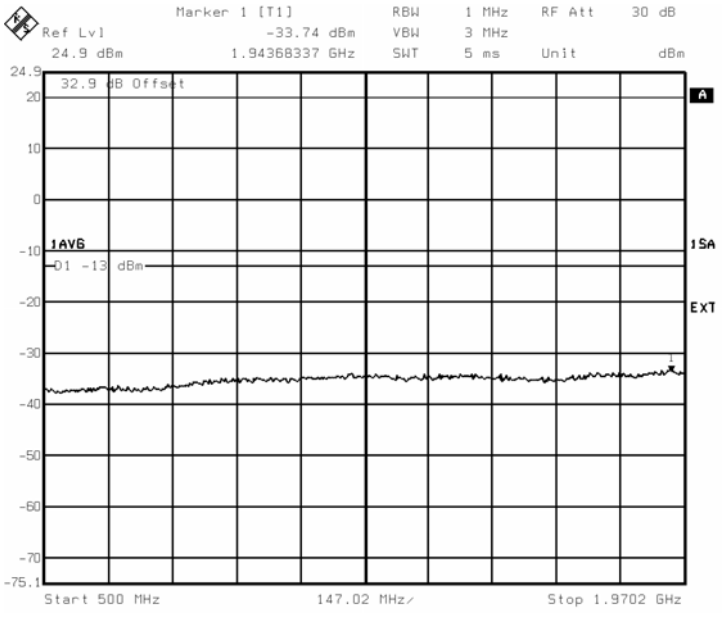
RBW = 1 MHz

Note : spectrum lines at 100 kHz is internal DC spectrum line of Analyzer.

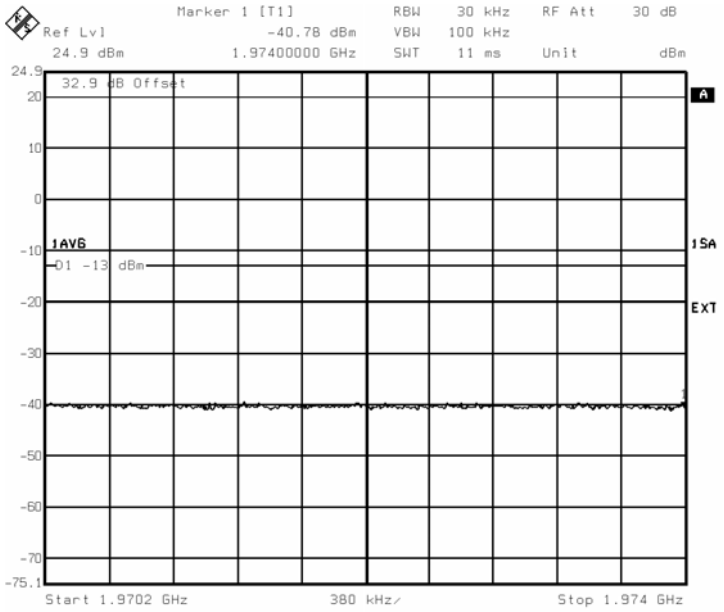
50 MHz–500MHz



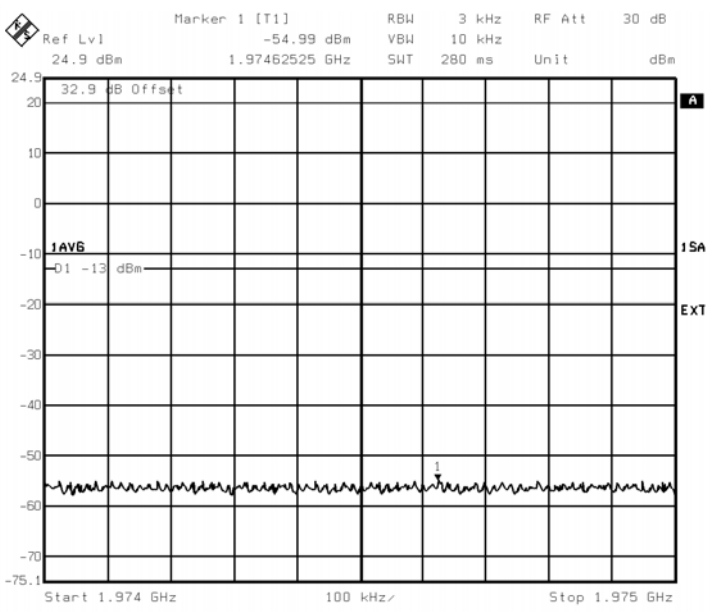
500 MHz-1970.2 MHz



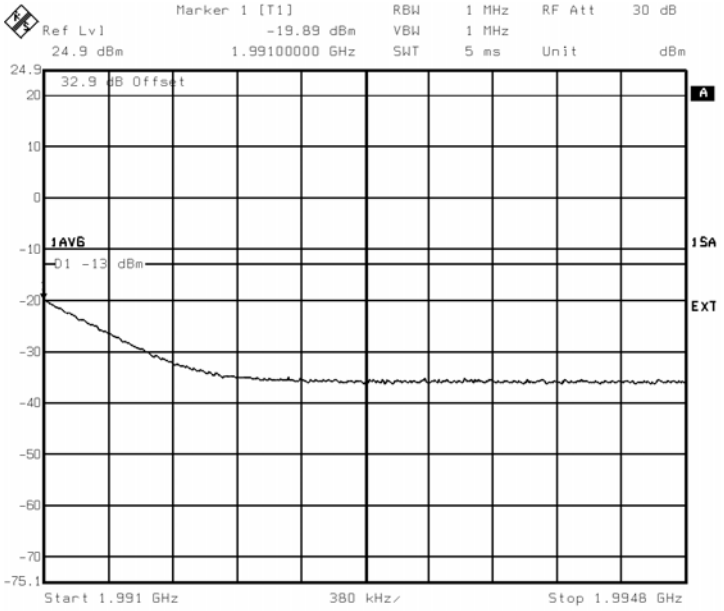
1970.2–1974 MHz



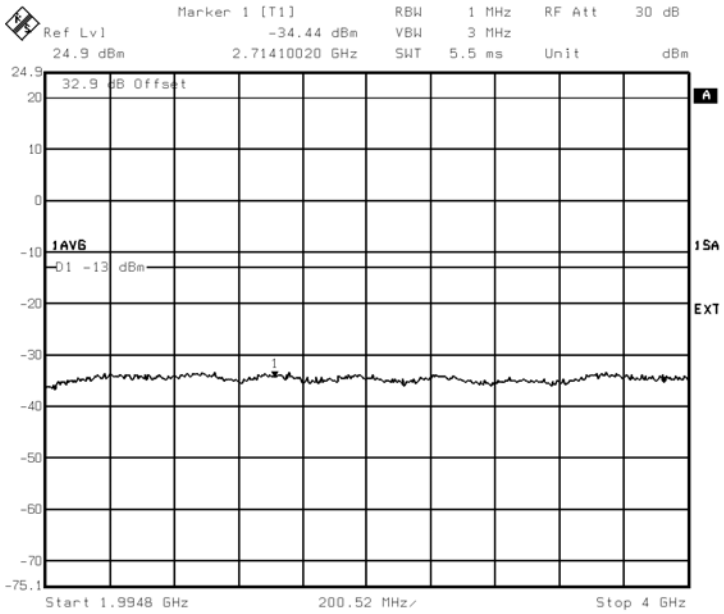
1974 MHz-1975 MHz



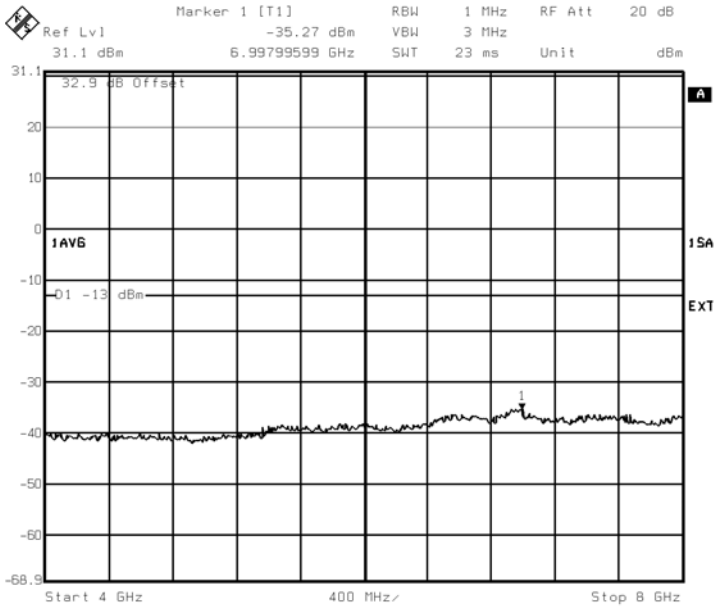
1991 MHz-1994.8 MHz



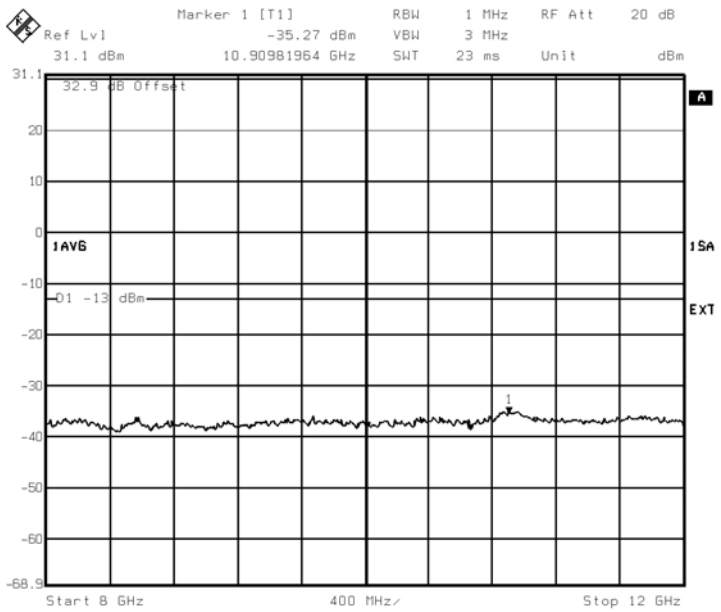
1994.8 MHz-4 GHz



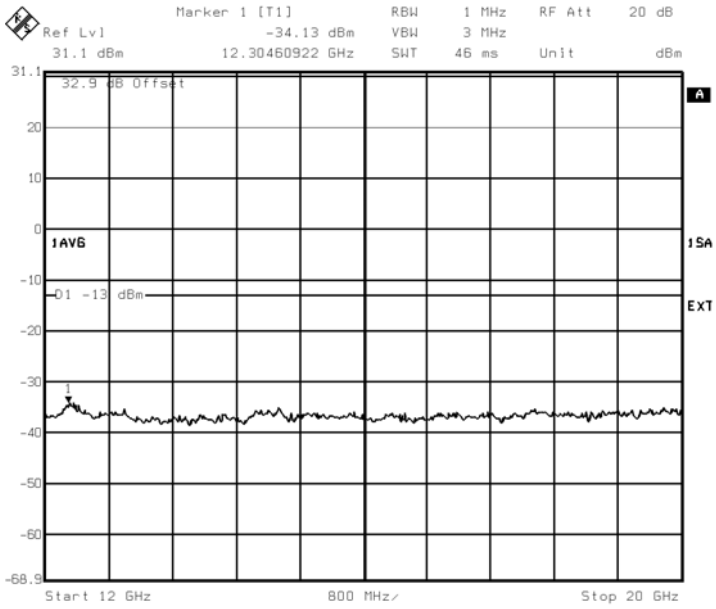
4–8 GHz



8-12 GHz



12-20 GHz



Notes:

Figure 10 and Figure 11 show sample plots for the case when the transmitter was tuned to Channel 512 (lowest channel in Tx band) .
Figure 12 and Figure 13 show sample plots for the case when the transmitter was tuned to Channel 810 (highest channel in Tx band) .
Figure 14 show sample plots for frequency spans from 0 to 20 GHz with emission on channel 810 (Pmax).

Conclusion : .

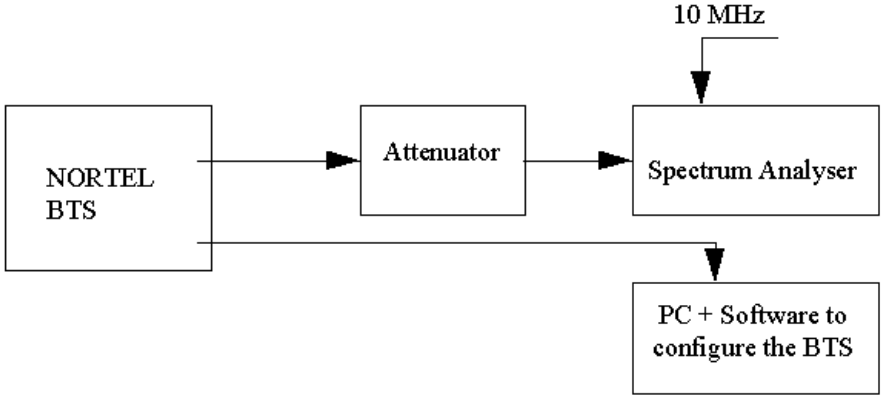
The worst case is the Duplexer configuration and it has been done at P_D max - 4dB = 40 dBm

In order to comply with the emission limits in the 1 MHz bands immediately outside and adjacent to the frequency block, the absolute transmit power level of the block edge channels is set to **40 dBm** in GMSK modulation at antenna connector.

3.5.4 TEST PROCEDURE

The equipment was configured as shown in Figure 15.

Figure 15: Test configuration for Spurious emissions at antenna terminals



For adjacent channels emissions, the BTS nominal carrier frequency was adjusted to each block edge channel.

Channels 512 and 810 are respectively Bottom and Top channels of the PCS 1900 band.

The transmitter was set to operate to maximum power in Tx activation mode GMSK no synchro.

Initially the transmitter was set to operate to maximum power. Then in case of out of limits, the power has been decreased by 2 or 4dB.

For these measurements, the resolution bandwidth was of the spectrum analyzer was set to at least 1% of the emission bandwidth. In this case the emission bandwidth measured was near 300 kHz. Therefore, the resolution bandwidth was set to 3 kHz.

The spectrum analyzer had the following settings for adjacent band:

Resolution bandwidth:	3 kHz
Video bandwidth:	10 kHz
Span :	1 MHz
Reference Level Offset:	Corrected to take into account cables and attenuator losses
Sweep time:	Coupled
Detector:	Sample
Trace:	Average
Sweep count:	200

For all other measurements the BTS carrier frequency was adjusted to Channel 190 in GSM850 and Channel 810 in PCS 1900.

The spectrum analyzer had the following settings for out of block emissions.

Resolution bandwidth:	1 MHz
Video bandwidth:	1 MHz

The emissions were investigated up to the twentieth harmonic of the fundamental emission (20 GHz).

The measured level of the emissions was recorded and compared to the -13dBm limit.

3.6. TEST NAME: 2.1055 FREQUENCY STABILITY

3.6.1 FCC REQUIREMENTS

The frequency stability shall be sufficient to ensure that the fundamental emission stays within the authorized frequency block.

3.6.2 TEST RESULTS GSM 850

Table 5 shows the Frequency Stability for channel 190 (F=881.6 MHz) in BTS 12000 OUTDOOR configuration under extreme conditions.

Table 5: Frequency Stability in BTS S12000 Outdoor configuration – Channel 190

Temperature (°C)	**Maximum Carrier Frequency Deviation (Hz)**		
	85% Nominal Supply voltage 195 V AC	Nominal Supply voltage 230V AC	115% Nominal Supply voltage 264 V AC
-30	7.75	7.43	-7.43
-20	11.69	-11.56	10.46
-10	10.85	9.81	-11.24
0	15.56	13.11	12.53
10	-10.65	13.3	-11.75
20	8.33	13.04	8.85
30	11.69	10.65	-12.91
40	14.98	11.69	-8.78
50	10.2	-10.53	10.98

The maximum frequency deviation allowed is 45 Hz.
The maximum deviation measured (15.56 Hz) is more than sufficient to ensure that the fundamental emission stays within the authorized frequency block.

3.6.3 TEST RESULTS PCS 1900

Table 6 shows the Frequency Stability for channel 661 (F=1960 MHz) in BTS 12000 OUTDOOR configuration under extreme conditions.

Table 6: Frequency Stability in BTS S12000 Outdoor configuration – Channel 661

Temperature (°C)	Maximum Carrier Frequency Deviation (Hz)		
	85% Nominal Supply voltage 195 V AC	Nominal Supply voltage 230V AC	115% Nominal Supply voltage 264 V AC
-30	17.95	16.14	18.02
-20	14.72	-21.50	19.24
-10	17.56	-23.31	-23.70
0	-18.08	23.44	-19.24
10	22.79	20.86	-19.63
20	18.92	-22.34	16.14
30	17.37	19.31	-25.18
40	27.51	20.99	23.34
50	22.02	-19.05	22.86

The maximum frequency deviation allowed is 90 Hz.

The maximum deviation measured (-25.18 Hz) is more than sufficient to ensure that the fundamental emission stays within the authorized frequency block.

The S12000 Outdoor BTS complies with the requirement.

3.6.4 TEST PROCEDURE

Thermal tests have been performed with OUTDOOR BTS S12000.
The BTS S12000 must operate under the following external extreme temperatures:

- BTS S12000 Outdoor : - 30°C / + 50 °C

Frequency stability test is performed under following extreme conditions:

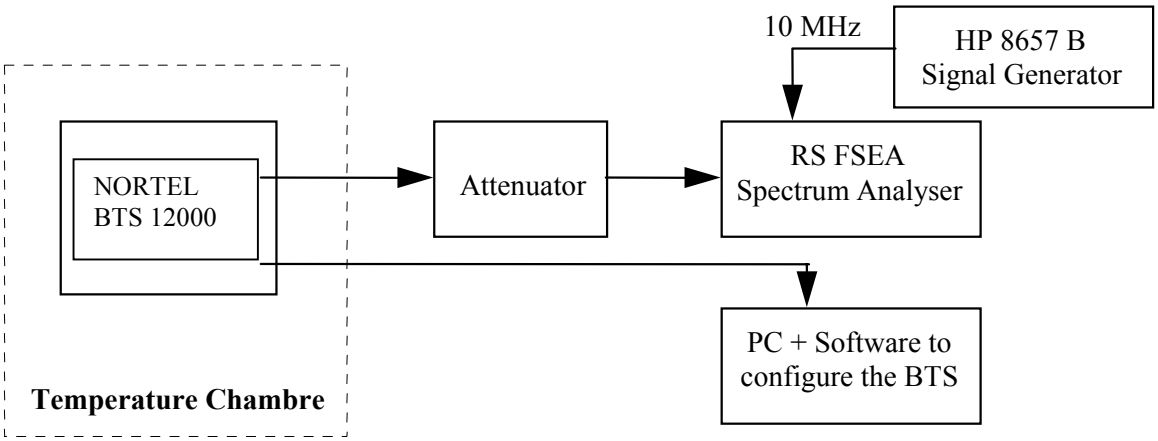
- Temperature from –30°C to +50°C at intervals of 10 degrees.
- With AC power supply variations: 195 VAC , 230 VAC, 264 VAC.

Modules (eDRX and eSCPA) run with nominal power regulation at maximum power (30W) in GMSK modulation. The eDRX/eSCPA were configured to transmit at maximum power (Static level 0).

A period of at least one hour was allowed prior to measurement to ensure that all the components of the oscillator circuit was stabilized at each temperature.

The equipment was configured as shown in figure 16.

Figure 16: Test configuration for Frequency Stability



3.7. MEASUREMENT EQUIPMENT LIST

Table 7 is a list of the measurement equipments used in these tests.

Table 7: Measurement Equipment List

Equipment Description	Manufacturer	Model	Serial No.	V/A date
Power Meter	Giga-tronics	8542C	515956	03.03
CW Power Sensor	Giga-tronics	80401A	516185	02.03
Spectrum Analyzer	Rohde & Schwarz	FSEA	502581	04.03
Spectrum Analyzer	Rohde & Schwarz	FSEB	508707	03.03
Spectrum Analyzer	Rohde & Schwarz	FSEM	525495	03.03
Signal Generator	Hewlett Packard	8657B	508064	03.03
Variable power supply	Wayne Kerr	AP60150A	T225122	06.03
Variable power supply	Wayne Kerr	AP60150A	T225358	03.03
Variable power supply	Elgar	5250M	516184	09.02
Temperature chambre	SECASI technologies		509921	03.03
30 dB attenuator	Spinner		25483	
10 dB attenuator	Spinner		22476	
20 dB attenuator	Radiall		R417320110	
20 dB attenuator	Radiall		R417020128	

4. EXHIBIT 2: UPDATED EQUIPMENT LIST

Description	Hardware code	Comment
Base Cabinet		
CPCMI T1	NTQA66AA	
CMCF	NTQA66CB	
CBCF	NTQA66GA	

Description	Hardware code	Comment
Radio Modules GSM 1900		
GSM 1900 DRX	NTQA01DA NTQA88PA	DRX ND eDRX
GSM 1900 Splitter	NTQA10AA	
GSM 1900 Power Amplifier	NTQA50DB NTQA50GA	 eSCPA
GSM 1900 Duplexer	NTQA51DA	
GSM 1900 Two Ways Hybrid Duplexer	NTQA51AA	
GSM 1900 Four Ways Hybrid Duplexer	NTQA52BA NTQA52BB	Without TOS meter With TOS meter

Power limitation to comply to Adjacent Band spurious for PCS1900 Band
The transmit power level of the block edge channels power has been done at P_{Dmax} = 40dBm in GMSK modulation at antenna connector .

Description	Hardware code	Comment
Radio Modules GSM 850		
GSM 850 DRX	NTQA88HA	eDRX
GSM 850 Splitter	NTQA88XA	
GSM 850 Power Amplifier	NTQA37AA	eSCPA
GSM 850 Duplexer	NTQA38CA	
GSM 850 Two Ways Hybrid Duplexer	NTQA38BA	

Power limitation to comply to Adjacent Band spurious for GSM850 Band
The transmit power level of the block edge channels power has been done at P_{Dmax} = 42dBm in GMSK modulation at antenna connector .

5. ABBREVIATIONS AND DEFINITIONS

5.1. ABBREVIATIONS

BCF	Base Common Function
BTS	Base Transceiver Station
DRX	Driver Receiver Unit
EDGE	Enhanced Data for GSM Evolution
e-DRX	EDGE DRX
e-SCPA	EDGE Single Carrier PA
GPRS	General Packet Radio Service
GSM	Global System for Mobile Communications
LNA	Low Noise Amplifier
MSC	Mobile Switching Center
OMC	Operation and Maintenance Center
PA	Power Amplifier
RF	Radio Frequency
TCU	Trans-Coding Unit
Tx	Transmitter

5.2. DEFINITIONS

Frequency Band and Channels

GSM 850	C128	C190	C251
Short	B	M	T
F Tx (MHz)	869.2	881.6	893.8
F Rx (MHz)	824.2	836.6	848.8

PCS 1900	C512	C661	C810
Short	B	M	T
F Tx (MHz)	1930.2	1960	1989.8
F Rx (MHz)	1850.2	1880	1909.8

END OF DOCUMENT